

MIM Case Study—Housing



Application: telecommunications electronics housing

Functional requirements: magnetic isolation, heat dissipation, easy assembly

Competing technologies: machining

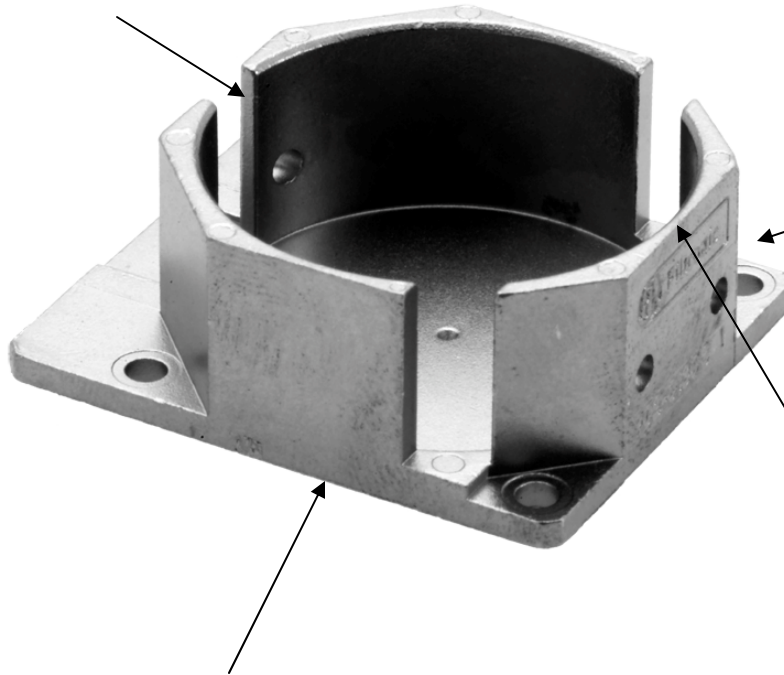
Overall size: L x W x H = 32 mm x 24 mm x 10 mm

Part weight: 15 grams

Material: MIM-2200

Key Characteristics—Housing

Threads added as a secondary operation to accommodate protective lid



Side holes for assembly and logo created through slides

Thin sections <1 mm

Flatness for heat dissipation, proper assembly <0.1 mm

MIM Case Study—Housing

- Why MIM?
 - Production rates >50,000 per month at peak easily handled by a 4-cavity tool
 - Replication of details (radii, logo, hole locations, etc.) in MIM was excellent with little variation
 - Good magnetic properties for shielding
 - No problem with plating (Ag over Ni)
 - Little material waste
 - Fewer burr removal problems
 - Side slots for assembly handled in tooling

MIM Case Study—Housing

- MIM Issues

- Flatness <0.1 mm required for heat dissipation and assembly of fragile components
 - Coining on low-tonnage press helped but could not deliver assured flatness for 32 mm x 24 mm area
 - Processing conditions played a key role in getting the best flatness out of the furnace
 - Finally needed a grinding operation to assure compliance
 - Quality verification difficult to coordinate
- Quality of thread (40UNS) on 21 mm I.D.
 - Geometry and quality would not allow molded-in threads
 - Machined in-house on CNC
 - Quality verification difficult to coordinate
 - Burrs

MIM Case Study—Housing

- Economics
 - Needed a 4-cavity tool for production rates and cost
 - The key to profitability was efficiency in secondary operations
 - Unforeseen costs were in inspection and achieving flatness
- Conclusion
 - Good application for MIM
 - Assembly moved to China so production has mainly moved to China
 - Major costs savings in plating costs